**International Journal of Agricultural Science and Research (IJASR)**
**ISSN(P): 2250-0057; ISSN(E): 2321-0087**
**Vol. 5, Issue 5, Oct 2015, 103-108**
**TJPRC Pvt. Ltd.**

# CORRELATION COEFFICIENT ANALYSIS IN IVY GOURD

## (*Coccinia grandis* (L.) Voigt)

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## ABSTRACT

Thirty six genotypes of ivy gourd (*Coccinia grandis* (L.) Voigt) were planted in a randomized block design (RBD) with three replications at Horticulture Farm, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the summer-kharif season 2014-15. Correlation analysis carried out to study the various yield attributing characters namely vine length (cm), internodal length (cm), petiole length (cm), leaf length (cm), leaf width (cm), fruit length (cm), fruit diameter (cm), average fruit weight (g), number of fruits per plant, yield per plant (kg), TSS ($^0$Brix), fruit volume (cc), specific gravity (cc) for identification of potential selection indices. Correlation coefficient analysis revealed that fruit yield highly significant positive correlation with vine length, fruit diameter, and average fruit weight, number of fruits per plant and fruit volume at phenotypic and genotypic levels at both genotypic and phenotypic levels, hence selection based on these characters would be more rewarding.

**KEYWORDS:** Genotypes, Correlation, Genotypic, Phenotypic, Fruit Yield

## INTRODUCTION

Little gourd (*Coccinia grandis* (L.) Voigt) is also known as Kundru (Hindi), tondle (Marathi), giloda (Gujrati), kundhti (Sanskrit) is an underutilization and underexploited perennial, diouceous, cucurbitaceous vegetable which give continuous fruit 7-8 month except winter due to vine are stunted due to low temperature. It is originated to India (Nath, 1966). It has been cultivated in Asian countries, Fiji, Africa, Central America, China etc. it is very important due to high nutritive value, high protein contents and vitamin C (Gopalan *et al.* 1982). It has many medicinal value includes skin diseases, tuberculosis, eczema, antidiabetic. In Chhattisgarh it has been cultivated in Bastar, Raipur, Durg, Dhamtari, Naraynpur and Raigarh district. Farmer has less favour for it commercial cultivation due to non-available of commercial improved varieties. The natural genetic variation or most of yield contributing characters are considerable in the crop but very mearge genetic information is available on the improvement for yield and their attributing characters in these crops.

Yield is a complex character it is under polygenic control and it is very influence by the environment. An efficiency of selection for many economic traits are depended on knowledge of association of characters on environment and degree of association. Correlation coefficient analysis is an effective basis for phenotypic selection in plant population. Larner (1958) stressed the importance of correlation of the various characters with yield. The phenotypic correlation indicate the extend of the observed relationship between characters, while genotypic correlation provide an estimate of inherent association between genes controlling any two characters. Correlation coefficient analysis is important useful in

determining the relative influence of the various characters on yield.

Many researcher have correlation studied the in various cucurbitaceous crops. Highly significant correlation of fruit yield were observed with number of fruits per plant in pointed gourd (Singh *et al.* 1993), number of fruits per plant, number of internode, length of fruits, diameter of fruits and specific gravity in ivy gourd (Sarnaik *et al.* 1999 ), fruit weight, fruit diameter and number of primary branches per plant in spine gourd Sarkar (1999), fruit size in pointed gourd (Srivastava *et al.* 2005) and vine length, number of stem per plant, days to last fruit harvest, fruiting period, fruit length, fruit diameter, number of fruits per plant in spine gourd (Alia *et al.* 2014). Present study was carried out correlation coefficient analysis for various yield attributing characters in ivy gourd.

## MATERIALS AND METHODS

Thirty six genotypes of ivy gourd (*Coccinia grandis* (L.) Voigt) were planted in a randomized block design (RBD) with three replications at Horticulture Farm, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the summer-kharif season 2014-15. Each genotypes are planted in 3 m distance both plant ot plant and row to row. The required cultural practices were adopted to obtain the better yield of the crop. The observation were recorded on thirteen characters viz. vine length (cm), internodal length (cm), petiole length (cm), leaf length (cm), leaf width (cm), fruit length (cm), fruit diameter (cm), average fruit weight (g), number of fruits per plant, yield per plant (kg), TSS ($^0$Brix), fruit volume (cc), specific gravity (cc).

## RESULTS

Correlation coefficient analysis study of the estimate of phenotypic and genotypic coefficient of variation (Table 1), in general, it was observed that estimate of genotypic correlation coefficient were higher than the phenotypic correlation coefficient for all of the characters, thereby establishing strong inherent relationship among the character studied. The low phenotypic value might be due to applicable interaction of the genotypes with the environment. Correlation analysis revealed that fruit yield per plant expressed a highly significant positive correlation with vine length, fruit diameter, and average fruit weight, number of fruits per plant and fruit volume at both phenotypic and genotypic levels.

Vine length showed significance positive correlation with fruit diameter, average fruit weight and fruit volume at genotypic level. It was also showed significant positive correlation with fruit yield per plant both genotypic and phenotypic levels. Internodal length showed significant positive correlation with petiole length, leaf length, leaf width for both genotypic and phenotypic levels. Petiole length found positively correlated with leaf length, leaf width, fruit diameter, average fruit weight and specific gravity at genotypic level. Leaf length showed significant positive correlation with leaf width at both phenotypic and genotypic levels. It also showed significant positive correlation with fruit length at genotypic level. Leaf width showed significant positive correlation fruit length at genotypic level. Fruit length showed significant negative correlation with fruit diameter and TSS at genotypic level.

**Table 1: Phenotypic and Genotypic Correlation among Thirteen Traits of ivy Gourd**

| Characters | | Vine Length (Cm) | Internodal Length (Cm) | Petiole Length (Cm) | Leaf Length (Cm) | Leaf Width (Cm) | Fruit Length (Cm) | Fruit Diameter (Cm) | Average Fruit Weight (G) | No. of Fruits Per Plant | TSS (°Brix) | Fruit Volume (Cc) | Specific Gravity (Cc) | Fruit Yield Per Plant (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vine length (cm) | P | 1.000 | 0.033 | 0.127 | 0.078 | 0.160 | 0.114 | 0.284 | 0.289 | 0.270 | -0.082 | 0.277 | 0.107 | 0.366** |
| | G | 1.000 | 0.163 | 0.214 | 0.197 | 0.291 | 0.118 | 0.369* | 0.518** | 0.320 | -0.052 | 0.522** | 0.194 | 0.471** |
| Internodal length (cm) | P | | 1.000 | 0.532** | 0.383* | 0.330* | -0.037 | 0.057 | 0.139 | -0.001 | 0.014 | 0.135 | 0.045 | 0.064 |
| | G | | 1.000 | 0.700** | 0.531** | 0.448** | -0.018 | 0.206 | 0.144 | 0.116 | 0.057 | 0.139 | 0.052 | 0.167 |
| Petiole length (cm) | P | | | 1.000 | 0.238 | 0.247 | -0.099 | 0.139 | 0.266 | 0.046 | -0.032 | 0.242 | 0.157 | 0.176 |
| | G | | | 1.000 | 0.375* | 0.344* | -0.118 | 0.330* | 0.331* | 0.118 | -0.001 | 0.288 | 0.493** | 0.249 |
| Leaf length (cm) | P | | | | 1.000 | 0.853** | 0.277 | -0.252 | 0.054 | -0.194 | 0.031 | 0.029 | 0.125 | -0.143 |
| | G | | | | 1.000 | 0.998** | 0.427** | -0.303 | 0.012 | -0.216 | -0.069 | 0.005 | 0.101 | -0.153 |
| Leaf width (cm) | P | | | | | 1.000 | 0.261 | -0.287 | 0.010 | -0.236 | -0.067 | -0.017 | 0.117 | -0.197 |
| | G | | | | | 1.000 | 0.372* | -0.323 | -0.069 | -0.258 | -0.083 | -0.069 | -0.008 | -0.218 |
| Fruit length (cm) | P | | | | | | 1.000 | -0.316 | 0.105 | -0.178 | -0.324 | 0.098 | 0.060 | -0.099 |
| | G | | | | | | 1.000 | -0.471** | 0.124 | -0.206 | -0.383* | 0.112 | 0.193 | -0.109 |
| Fruit diameter (cm) | P | | | | | | | 1.000 | 0.488** | 0.241 | 0.256 | 0.499** | 0.049 | 0.412* |
| | G | | | | | | | 1.000 | 0.650** | 0.295 | 0.292 | 0.665** | 0.139 | 0.489** |
| Average fruit weight (g) | P | | | | | | | | 1.000 | -0.036 | 0.127 | 0.925** | 0.289 | 0.360* |
| | G | | | | | | | | 1.000 | 0.073 | 0.145 | 0.995** | 0.456** | 0.425** |
| No. of fruits per plant | P | | | | | | | | | 1.000 | 0.147 | -0.007 | -0.163 | 0.902** |
| | G | | | | | | | | | 1.000 | 0.159 | 0.091 | -0.210 | 0.920** |
| TSS (°Brix) | P | | | | | | | | | | 1.000 | 0.156 | -0.091 | 0.181 |
| | G | | | | | | | | | | 1.000 | 0.185 | -0.254 | 0.192 |
| Fruit volume (cc) | P | | | | | | | | | | | 1.000 | 0.073 | 0.373* |
| | G | | | | | | | | | | | 1.000 | 0.362* | 0.434** |
| Specific gravity (cc) | P | | | | | | | | | | | | 1.000 | -0.019 |
| | G | | | | | | | | | | | | 1.000 | 0.011 |
| Fruit yield per plant (kg) | P | | | | | | | | | | | | | 1.000 |
| | G | | | | | | | | | | | | | 1.000 |

***significant at 0.05% and ** significant at 0.01% level**

Fruit diameter showed significant positive correlation with average fruit weight, fruit volume and fruit yield per plant at both genotypic and phenotypic levels. Average fruit weight has significant positive correlation with fruit volume at phenotypic and genotypic levels and specific gravity at phenotypic level and it was also showed significant positive correlation with fruit yield per plant for both genotypic and phenotypic levels. Number of fruits per plant showed significant positive correlation with fruit yield per plant for phenotypic level.

Fruit volume showed significant positive correlation with specific gravity at genotypic level. It had also significant positive correlation with fruit yield per plant both phenotypic and genotypic level.

## DISCUSSIONS

In general genotypic correlation coefficient were higher than phenotypic correlation coefficient for all the characters. Similar results were also noted by Malek *et al.* (2007) in pointed gourd. This showed strong inherent relationship among the character. Vine length had positively correlation with fruit yield per plant, higher the vine length higher the number of node per vine resulting in high yield because fruit are born on nodes. The positive correlation of fruit yield with vine length was also reported in snake gourd (Narayanankutty *et al.*, 2006; Kumaresan *et al.*, 2006). Fruit diameter positive significant correlation with fruit yield which increase the fruit yield similar result has been also found in

ivy gourd (Sarnaik *et al.,* 1999). Average fruit weight positively correlated with fruit yield which ultimately increase the fruit yield. The positive correlation of fruit weight with fruit yield was also reported in pointed gourd (Hazra *et al*., 2003), ivy gourd (Bharathi *et al.,* 2008) and snake gourd (Narayanankutty *et al.,* 2006; Kumaresan *et al.,* 2006). Number of fruits per plant significant positively correlate with fruit yield since number of fruits per plant increase the fruit yield similar result were also found in ivy gourd (Sarnaik *et al.,* 1999; Bharathi *et al.,* 2008), pointed gourd (Singh *et al.,* 1993; Hazra *et al*., 2003; Srivastava *et al.,* 2005; Khan *et al.,* 2009) and spine gourd (Alia *et al.,* 2014). Fruit volume also positively significant positively correlate with fruit yield similar result was also reported in ivy gourd (Sarnaik *et al.,* 1999), pointed gourd (Sarkar, 1999), anchote (Basusumatary *et al.,* 2014) and spine gourd (Hazra *et al*., 2003).

## CONCLUSIONS

The correlation coefficient analysis revealed that fruit yield had significantly positive correlation with vine length, fruit diameter, and average fruit weight, number of fruits per plant and fruit volume but the fruit length was showed negative correlation with the fruit diameter and TSS. It is clear from the result of the investing that vine length, fruit diameter, and average fruit weight, number of fruits per plant and fruit volume are most important yield attributing traits of ivy gourd which may be considered for making selecting of high yielding genotypes of this crop.

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